Madison, WI.
MAUG Newsletter
P.O. BOX 56191, MADISON, WI 53705
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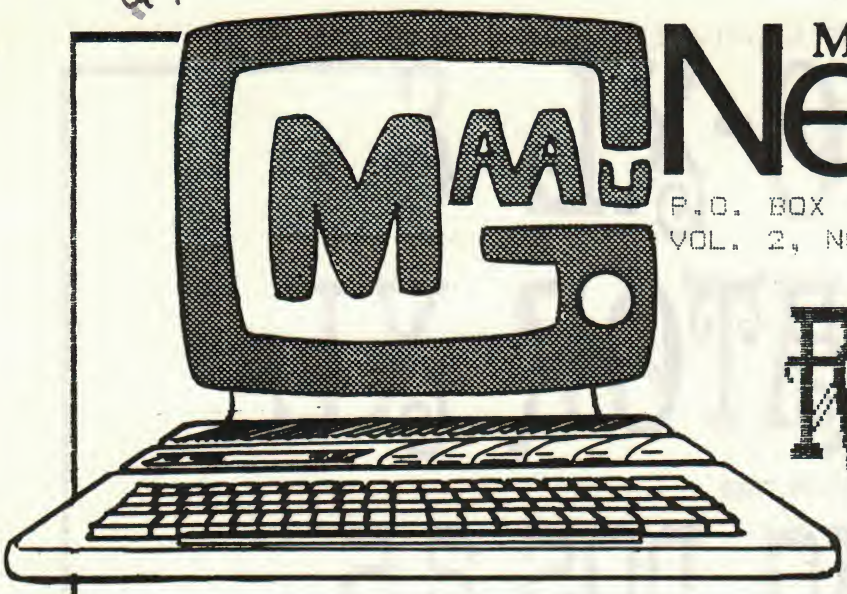
(SPECIAL ISSUE)

RAMBO-XL



TUESDAY, OCT. 8th

MONTHLY MEETING

WEST HIGH AT 7:00 P.M.

A WORD OR TWO FROM THE CHAIR

BY KURT GRITTNER

The hardware SIG has been really busy this month. The 256/512K mod to the 800XL has been going at supersonic speed. The circuit boards are in print and the first two to be tested worked perfectly with 256K installed. I have a patched version of DOS 2.5 that expands D8: to 720 sectors and also gives you D7: with 720 sectors. The price of the RAM chips is still dropping (now $2.95 @), so the entire modification can be done for under $30. One annoying thing about the modification is that you have to leave the power off for the count of two when rebooting, or else the computer sometimes does a warm-start instead of rebooting. That means that the 256K RAM chips (at least the ones that I have) can run off the board's capacitors for a second or more without losing all their data... so there should be more than enough power in the 800XL to drive 512K of memory.

This project is and has been extremely exciting, and it has also been gratifying to experience such a high degree of co-operation and co-ordination between members of the club. Thanks to: Mike Redmond, who kept the hardware SIG going in spite of its unofficial status and who did the wiring diagram and the preliminary artwork; Al Divine, who did the camera-ready artwork; Dave Mullenix, who produced the circuit boards; and Paul (Dave's friend), who assembled and tested the first circuit board. I did the conceptual design and built the prototype on an experimenters board using single-strand 20 gauge wire, and alligator-clip leads for jumpers.

By the time you read this, the October 1st hardware SIG meeting will already have taken place. We will definately have a 256K 800XL to show at the October 8th general meeting, and perhaps even a half-a-megabyte ATARI!!! See you there! □

RAMBO-XL & TERMINATOR-XL

BY KURT GRITTNER

PATCHING DOS 2.5

This issue of the MAAUG newsletter is almost entirely devoted to the memory upgrade hardware project for the 800XL. I will attempt to explain this amazing magical item and its possible uses.

The recent radical drop in prices of the 256K RAM chips (41256) has made this upgrade cost effective. The fact that the 256K chips are so nearly identical to the 64K chips that come installed in the 800XL makes it technically possible. The altered (patched) version of DOS 2.5 makes the extra memory usable to the average ATARI 800XL owner.

The implementation of this upgrade was made substantially easier by a recent article in the September issue of BYTE magazine (Page 247). This article was useful because it revealed that Antic chips with part number: C021697 supply all the neccesary refresh signals for the memory chips, while those with part number: C012296 do not.

The circuit design by the MAAUG harware SIG ONLY applies to 800XL having Antic chips with the C021697 part number. (The Antic chip is designated "U7" on the circuit board).

Because the 800XL can only directly use 64K of memory, it is necessary to use something called a RAM-disk in order to access the extra memory. Luckily for us, the new ATARI 130XE comes with DOS 2.5 which already supports a RAM-disk as D8:. DOS 2.5 will work with our memory upgrade without modification; however, since the 130XE only comes with 128K, DOS 2.5 has no way of knowing about the extra memory that our modification provides.

The following is a description of how to modify DOS 2.5 in order to provide D8: with a full 720 sectors (instead of the 512 sectors provided); and to add D7: with 720 sectors. This procedure is included for the benefit of other users groups... MAAUG members need not read this section since they can get the patched DOS at a MAAUG meeting. You will need an ASSEMBLER cartridge to install this patch:

PATCHING DOS 2.5

1) Insert your assembler cartridge.
   Put DOS 2.5 in drive 1.
   Cold start your machine.

2) When the "EDIT" prompt appears,
   get into debug mode by typing:
   "BUG".

3) When the "DEBUG" prompt appears,
   get into the mini-assembler by
   typing: "A".

4) Type the following lines ending each by pressing the RETURN key. The mini-assembler will respond to each line with one or more lines of assembled object code. Notice that you MUST type a space after each "<" sign (Which denotes the end of the address and the start of the instruction.

```
B86< LDX #0
105C< LDA #$64
12DE< LDY $21
< CPY #8
< BCC *+4
< ADC #5
< TAY
< LDA $185B,Y
< JMP $1846
148D< CMP #6
14C4< LDA #$70
< JSR $1846
183A< .BYTE "MEM.SAV ERR",$9B
1846< STA $44
< LDA $D301
< AND #$83
< ORA $44
< STA $D301
< RTS
185B< .BYTE $20,$24,$28,$2C
< .BYTE $40,$44,$48,$4C
< .BYTE $60,$64,$68,$6C
77F< CPX #7
< BCC $78A
B88< CMP #7
< BCS $BD3
105E< CPY #7
< BCS $1076
70A< .BYTE $C3
```

5) Press the RETURN key to exit the mini-assembler mode.

6) Type "X" followed by RETURN to return to the EDIT mode.

800XL EXPANSION UPGRADE

(Continued from previous page) BY KURT GRITTNER (SPECIAL ISSUE)

7) Type "DOS" to access the DOS menu.

8) Write the DOS files out to drive 1.

9) Turn off the machine and cold start DOS... When you do a directory of D8: you should now have 620 sectors free (Instead of 499). Use the "I" command to format D7:. When you do a directory of D7: you should have 707 sectors free. (D8: is automatically formated by the "RAMDISK.COM" program if present on the disk when DOS is loaded).

10) Pat yourself on the back... you now have two full sized RAM-disks.

Note: This patch will only drive 256K. A single patch to drive either 256K or 512K will be forthcomming as soon as we have a working 512K memory upgrade installed.

QUIRKS:

DONT erase DOS.DUP or MEM.SAV from D8:

DONT write DOS files to D5: thru D7:

DONT try to copy MEM.SAV

DONT count on the Duplicate disk function always working between RAM-disks.

DONT turn off your machine and expect data written only to a RAM-disk to still be there when you turn it back on.

DONT run any 130XE programs that use extra memory without first saving any data that you need to keep from your RAM-disks to a real disk. (For example a sector copier).

DONT expect all 130XE software to work since there is one function of that machine which is not duplicated by this memory upgrade... namely: the extra memory video chip enable line (PB5) is being used by us as an address line.

Two DOS error messages were shortened and/or disfigured in order to make room for these patches. They are: "Type Y to still run DOS" and "ERROR-saving user memory on disk". The latter now reads: "MEM.SAV ERR" and the former now is illegible. (Asi es la vida).

If the 512K version of the upgrade is installed, then the Self-test feature of the 800XL must be sacrificed. (I never used it anyway).

HOW TO USE A RAMDISK

Those of you who have ever used DOS 2.5 on an ATARI 130XE will already be familiar with the use of D8: as a 499 sector RAM-disk. If you haven't ever seen DOS 2.5, then this section is for you:

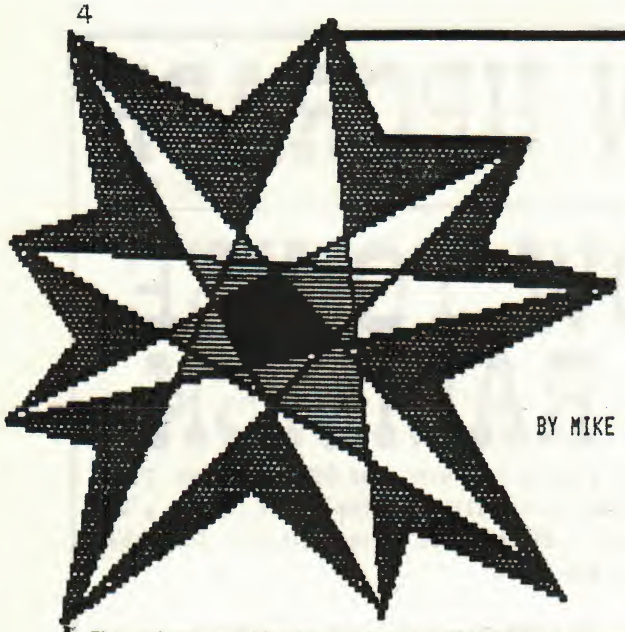
Basically, the RAM-disk mimics all the functions of an 810 disk drive. That is, where ever you would type D: you can now type D8: instead to direct disk I/O to RAM instead of to a real disk drive. Some examples are:

```
RUN"D8:PROGRAM1.BAS"

SAVE"D8:PROGRAM2"

LOAD"D8:MYMENU.BAS"

LIST"D8:PROGRAM3.LST"

ENTER"D8:MERGELIN.LST"

OPEN #1,4,0,"D8:MYDATA.IN"

OPEN #1,8,0,"D8:MYDATA.OUT"
```

On the DOS menu, you can use the "C" function to copy files from one disk to another... even from one RAM-disk to another RAM-disk. Whenever you are prompted for a file name, just start your file name with D7: or D8: if you want to read from or write to one of the RAM-disks.

If you want to erase all of the files on D7:, it is much quicker to re-format the RAM-disk than to delete all the files one at a time. D8: should not be formatted because if you remove the "DUP.SYS" file from D8: and then go to the cartridge; you cannot get back to the DOS menu. It is also a good idea to leave the "MEM.SAV" file on D8: since this will prevent you from losing your basic program when you go back and forth between BASIC and the DOS menu.

Oh yes, and you will probably notice a slight difference in speed when you go to DOS using the RAM-disk. One or two seconds is all it takes. Remember to always SAVE your RAM-disk data onto a REAL diskette BEFORE TURNING OFF THE COMPUTER!□



HOW IT WORKS

BY MIKE REDMOND

Through a multiperson effort, MAAUG has managed to come up with the new RAMBO XL, 256K RAM upgrade for the 800XL. In concept, the RAM upgrade is similar to the one that appeared in the September '85 issue of BYTE. But the MAAUG RAMBO XL modification attempts to maintain compatibility with the 128K 130XE. From early tests, it seems that compatibility is pretty good unless the software makes specific use of the 130XE's ability to bank switch the video RAM. The MAAUG RAMBO XL just isn't able to do that. Otherwise, we've found that the RAMDISK.COM works without modification, as does DOS 2.5. To take full advantage of the 256K RAM mod, of course, DOS 2.5 and the RAMDISK handler must be modified to recognize the additional 128K RAM. A companion article describes what's involved in patching DOS 2.5 to do the job. The patch allows you to define two full size (707 sector) single density RAM disks as D7: and D8:.

How does it work? The circuit diagram is included in this article. Basically, the 64K RAM chips originally installed in the 800XL are removed and replaced with 256K RAMS. Then a new address decoding circuit is installed in place of a chip that originally did the 800XL address switching. Lines on the PIA are used to control the address selection in a way that simulates and extends the 130XE use of those lines.

Instead of switching memory in 32K blocks, as is done in the design that appeared in BYTE, the MAAUG circuit switches memory in 16K blocks like the 130XE does. This not only allows the RAMBO XL to work like the 130XE, it also removes the problem associated with swapping out operating system work space in the lower 16K of RAM. RAMBO XL switches the second 16K bank bracketted by the hex addresses 4000 to 7FFF. The 256K RAM space is divided into 16 segments that can be moved into the 4000 to 7FFF space. Four of the segments are normally used to simulate standard 800XL operation. The other segments are swapped in and out under control of RAMDISK or other RAM management software.

The circuit produces three address signals for the 256K RAM chips. For the lower address bits, address lines A0 through A13 (locations 0000 through 3FFF), the new address circuit doesn't come into play. The new circuit is also deactivated (using signal XE) when the computer attempts to address locations above 8000. In the 4000 to 7FFF range, sixteen new addresses can be generated on RA6, RA7 and RA8 to activate one of the 16 segments. The new RA6 and RA7 addresses are controlled by lines PB2 and PB3 from the PIA. These are the same lines used in the 130XE. PB4 is also used here (to generate the XE signal) as it is in the 130XE to enable extended memory addressing. RA8, which is not generated in the 800XL or the 130XE, is generated here by multiplexing PB5 and PB6 to the RA8 line. This provides access to the full 256K RAM by dividing it into four 64K segments that are then further subdivided into four 16K segments using PB2 and PB3. Unfortunately, PB5 is used in the 130XE to control video bank switching. Therefore, when 130XE software that expects to bank switch the video is used on the RAMBO XL terrible things will undoubtedly happen.

You may notice a bit of extra circuitry on the diagram. We haven't tested it yet, but this is the added stuff needed to build the MAAUG TERMINATOR XL, a 512K RAM upgrade. It generates two seperate CHIP SELECT signals to activate two seperate banks of 256K RAMS. It can be controlled by the PB7 signal which is normally used to do SELF TEST on the 800XL (don't try a self test on one of these machines). To build this one, you would have to stack two 256K chips in each socket and bend out the CHIP SELECT pins (if you can find them) on each bank. Maybe we can report on this one in our next newsletter.

In the meantime, you can follow the assembly instruction in an accompanying article. Artwork is included to put the whole thing on a printed circuit board to make it fairly neat and easy to do. Note: this circuit mod is designed to work with 800XL's that have the GTIA with part number C021697 (in location U7). If you have part number C012296 you will have to hack it on your own.

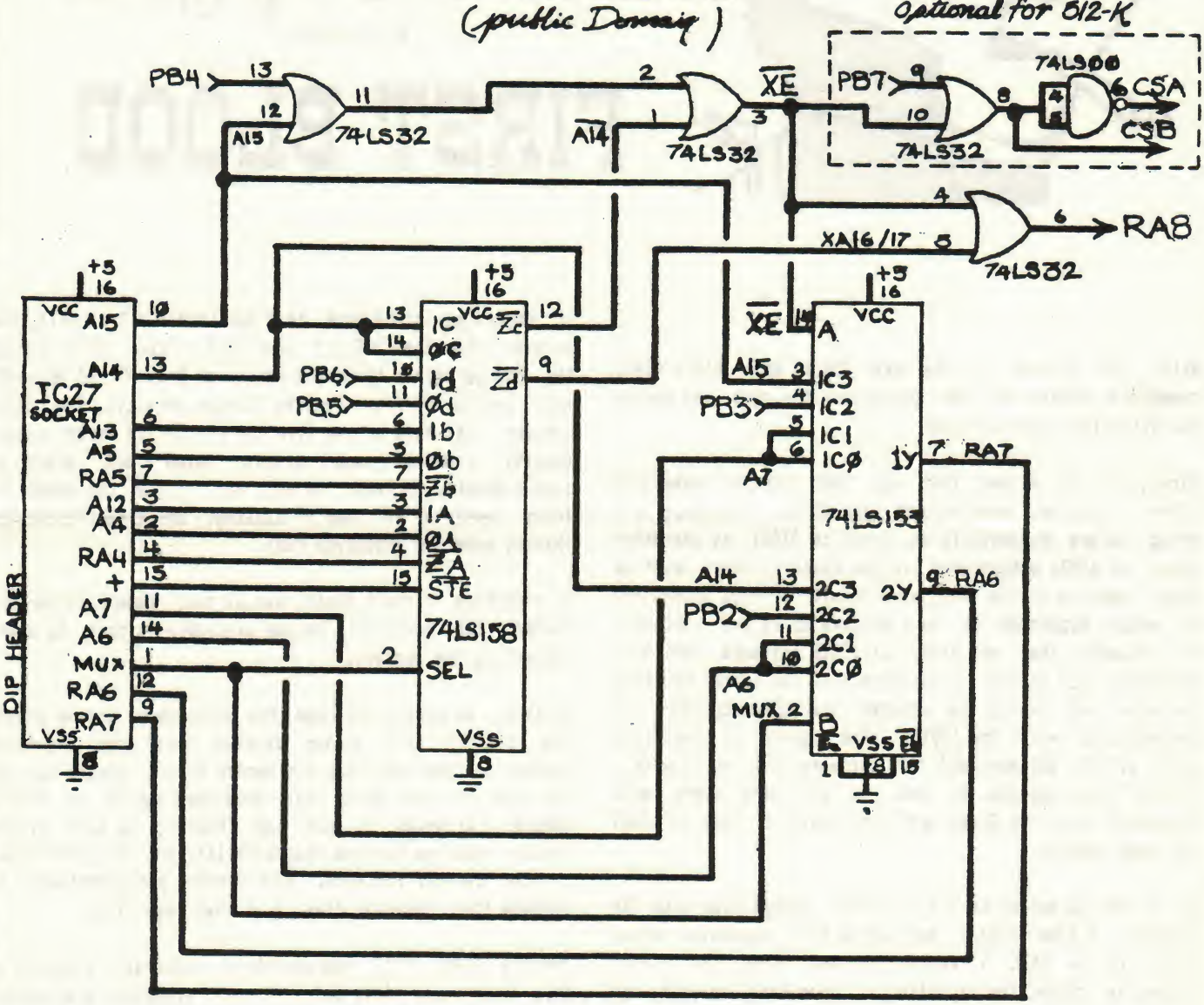
One final warning! This stuff has worked for us but it's not guaranteed! If you start hacking your machine, please be sure about what you're doing. The folks that devised this mod and MAAUG will not accept any responsibility for what you do to your own (consenting?) machine in the privacy of your home or workshop. And don't froget about warranties. Make sure your machine works (or wait for 90 days after purchase) before you break into it for something like this.

SO good luck and have fun! □

RAMBO-XL

256-K ADDRESS CIRCUIT DIAGRAM FOR 800XL'S (800XL COMPATIBLE)

BY MIKE REDMOND
(public Domain)



PARTS LIST

	$ each	$ TOTAL
8 x 41256-150 [16 x for 512-K]	2.95	23.60
1 x 74LS32	.18	.18
1 x 74LS00	.16	.16
1 x 74LS153	.39	.39
1 x 74LS158	.29	.29

RAMBO-XL EDITORIAL

BY AL DIVINE

FIRST BLOOD

With the arrival of the new 256-k and 512-k ATARI computers within our User group over the next few months, two situations come to mind:

First, it is evident that our User's group appears to offer a good deal more support than ATARI, and while as a group we are undoubtedly as loyal to ATARI as any other group of ATARI enthusiasts in the country, there must be some 'parting of the way' as a result of this innovation in memory expansion. We have discovered in one instance, for example, that one piece of 130XE software (which is evidently due to some idiosyncracy of the screen handling hardware and cannot be adapted via this upgrade), is incompatible with the 130XE. (The upgrade is compatible with all XL software and 800 software that we know of.) Making this upgrade on your XL will make users more dependent upon the Group and less likely to look to ATARI for user support.

To a limited extent we are in direct competition with The Company. I know that I decided as this expansion became known to me that I wanted to keep using the rather extensive collection of software I was familiar with, and also in which I had invested some hard earned bucks in, rather than try to unload it all to run out and purchase a machine which doesn't have BASIC available for it. Also if you were considering an XE, you will have to decide as I did, that I would rather take the 512-k upgrade minus the XE software compatibility, than the 128-k upgrade (a new XE), which costs about the same amount of dollars. This 256-k and 512-k expansion is compatible with all of the old software you are used to running on the 400, 600XL, 800, 800XL and 1200XL computers.

It should be noted here that our Leader, True Grit, has already rewritten DOS 2.5 such that on the 256-k upgrade the DOS perceives the extra memory as Drive-7 and Drive-8, each having 708 free sectors (Single density). The 512-k version will have drives five and six as 708 sector single density ramdisks and drives seven and eight as double-density drives. As you may imagine the speed of these ramdisks in simply amazing, as I can tell you (having seen the prototype run).

A prototype circuit board has already been printed and tested. This board will become available at cost to users requesting the upgrade.

Finally, we expect and hope that other user groups around the country will either develop their own expansion designs or use one that has become public domain such as the one our own group has developed (which is PUBLIC DOMAIN). Although it has been tested, we must firmly declare that we take no responsibility for its performance in the general instance. Each person who undertakes to upgrade their computer does so at their own risk.

Perhaps ATARI will upgrade their eight-bit machines at this point to a full 512-k, if the expansion bug catches on.

Individuals may purchase their parts on their own (or by requesting a group purchase at the next regular meeting). The following vendor is recommended (see the parts list at the bottom of the address circuit diagram):

JDR Microdevices
1224 S. Bascom Ave.
San Jose, CA 95128

□

ED SIG + 8 DAYS from 10/8

800 + 662-6279 25 watt

AND MORE NEWS IS COMING...

Due to a lack of space and the time required to prepare the articles for this special issue just a few days after the Hardware SIG had its meeting (in which they exhibited TWO of the new RAMBO-XL's), several articles and a copy of the circuit board, did not reach this office in time to be included in this month's ish. Next month's newsletter will contain step-by-step instructions on how to assemble the expanded memory as well as a copy of the circuit board diagram. □

SOLDER NITE!

In order to be able to reduce the number of problems evolving out of the expansion modification it was suggested by Dave M. that we get together for a "SOLDER NITE" and try to do all the soldering in a group under experienced coaching and supervision. This can be done either in separate groups or at the Hardware SIG. Please contribute your suggestions and contributions at the upcoming Monthly Meeting. □

RAMBO-XL DISCLAIMER

The information contained in the articles in the MAAUG Newsletter are intended for general distribution as the property of the Madison Area ATARI User's Group. The information is free and may be used in any way which is generally assumed to be appropriate by any individual or group of individuals as long as no financial compensation is incurred. Neither the articles nor the information contained in them is to be sold or distributed in exchange for money.

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NEWSLETTER CHANGES

The MAAUG Newsletter now has access to TYPESETTER, MEGAFONTII+ and PAGEDESIGNER (by XLENT Software), as well as PRINTSHOP (by DataSoft). Within the foreseeable future our newsletter will be produced, using this software completely by Atari computer as opposed to the old way of paste up from the artist's drawing board. In view of this transition, the artists and editors would appreciate all submissions to be published in the newsletter, images and text, to be transmitted on disk. Compatible images with our system include: Koala Pad, Atari Touch Tablet, Micropainter, Super Sketch. Compatible word processors include Text Wizard and Atari Writer. Paint and Letter Perfect are not compatible with our systems. □

SIG NEWS

BY SHIRLEY CZOSCHKE

EDUCATION SIG (or "beginners' SIG)

Last month, generally we had practice in operating the machine and various commands. Specifically, we had fun with "The Print Shop". In October we will continue with skills and practice as requested by the group.

Chair: Joe Imilkowski: 273 8999
Meeting: Wed., Oct. 16, 7:00. 2320 Rowley Ave. (one block south of West High School)

COMMUNICATIONS SIG:

Modem type communications including Bulletin Board, talking to other users....

Chair: Dave Mullinix: 249 6329
Meeting: (call for date), 135 Dewey St., Sun Prairie.

HARDWARE SIG:

The group is basically working on the RAM disk.

Chair: Mike Redman: 263 1584, 233 2405
Meeting: Tues., Nov. 5, 7:00. West High, Science Lab.

LANGUAGE SIG: (notice new chair)

The group will continue with the deep blue "C" - a language very similar to BASIC.

Chair: Joel Plutchak: 233 6853 (or call: George Tucker: 756 2459)
Meeting: Sat., Nov 9, (call for time and place) □

Nov 9th Software SIG

NEWSLETTER INFORMATION

This newsletter is written and printed by members of the Madison Area Atari Users Group, an association of individuals with a common interest in using and programming ATARI computers. The Madison Area Atari Users Group is not affiliated with the ATARI corporation or any other commercial organization.

All articles are written and donated by the membership. Occassionally an article will be reprinted from another user group with appropriate credit to the author and the user group. We extend this same courtesy to those who would like to reproduce portions of this newsletter. All articles reflect the opinion of the author and do not necessarily reflect the opinions of the Madison Area Atari Users Group.

Your contribution of articles is actively encouraged. You may submit your articles on ATARI compatible cassette or diskette or you can arrange with an editor to download your file via modem at 300 baud. Please delete control codes imbedded in the text which you submit. Deadline for articles in the 25th day of each month for inclusion in the next issue.

Write Madison Area Atari Users Group Newsletter, P.O. Box 56191, Madison, WI 53705 for more information.

MEMBERSHIP INFORMATION

Membership is open to individuals and families who are interested in using and programming ATARI computers. Your membership includes a subscription to this newsletter and access to the group's public domain cassette, diskette, and publication libraries. In addition to attending group functions and checking out materials from the libraries, members are entitled to vote in club elections and to hold elected position in the organization.

MEETING INFORMATION

Madison Area Atari Users Group meetings are held once each month. The meetings are currently being held in the IMC of West High School, Madison, WI. Meetings start promptly at 7:00 p.m. on the second Tuesday of each month.

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*An Independent Computer Users' Group

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